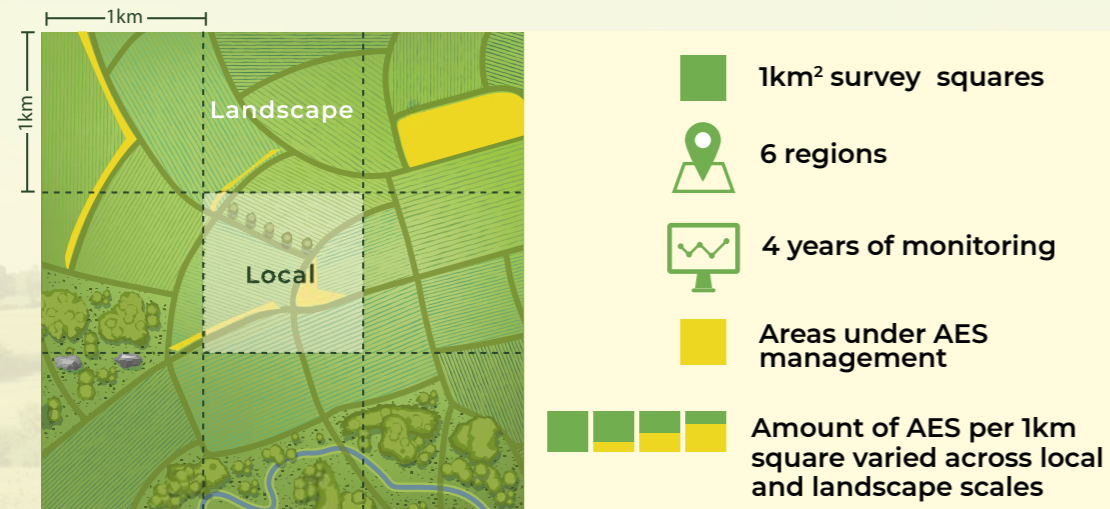


# Landscape-scale species monitoring of agri-environment schemes (AES)

## Baseline survey 2017 - 2021

Monitoring mobile species responses to agri-environment management at local and landscape scales, looking beyond the boundaries of individual farms and AES options.

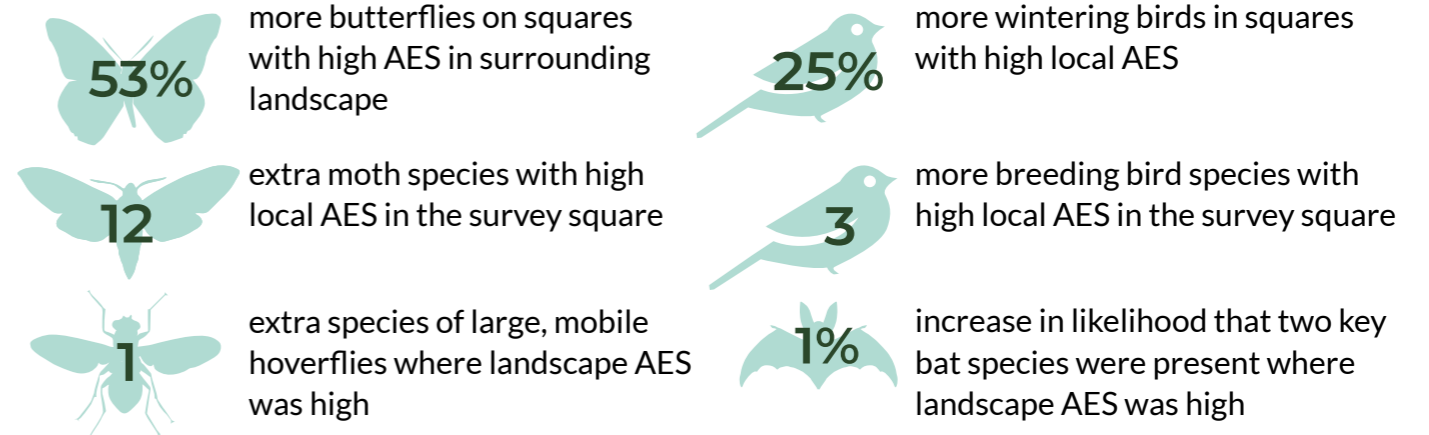


### Field surveys on 1km<sup>2</sup> survey squares



Insects, birds and bats were surveyed in spring/summer (April - August) each year, and birds in winter (November - March). Habitats, AES options, plant species and floral resources were also surveyed.

### Snapshot of baseline survey results



### Wider habitat and plant results

- More butterfly and bird species found in areas with a high diversity of habitats
- Areas with high plant diversity had more butterfly, moth and bat species
- More bumblebees were found where more flowers were present

For full results click here to see the [LandSpAES baseline report](#)



### How can you help mobile species including butterflies, moths, pollinating insects, birds and bats?

These results suggest more AES management (targeted at biodiversity) may benefit some butterfly, moth and bat species. Increasing the range of habitats and number of plant species on your land can also help insects, birds and bats.



With many thanks to everyone who has allowed access to their land for surveys, and supported the UKCEH and BTO surveyors during 2017-2021. Thanks also to the field surveyors who collected data for the LandSpAES project.

**Future plans.** We hope to run a resurvey of sites in a few years, if funding is available. A resurvey would allow us to understand whether the amount of agri-environment management, along with other habitat and plant variables, have an influence on population change for mobile species.

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[www.ceh.ac.uk/our-science/projects/landspaes](http://www.ceh.ac.uk/our-science/projects/landspaes)

# Summary of baseline survey



## Butterflies

We recorded 35 separate species of butterflies over the whole project, including rarer species such as the Pearl-bordered Fritillary and many of the most common Meadow Brown. Using our data from total counts of butterflies we found 53% more butterflies on squares with higher amounts of AES in the surrounding landscape.

## Moths

We saw 925 species of moth and 110,779 individuals across the four years of our survey. From Antler Moth through Elephant Hawkmoth, Ingrailed Clay, Thistle Ermine to Wainscot Neb we have sampled some amazing moths. There was an additional 12 moth species seen on average on squares with more AES. We split the moths into groups to help us to understand the results further. Moth species with more specialised habitat and diet requirements responded to AES in their local area, while the more generalist species responded to AES in the surrounding landscape.



## Breeding birds

We saw 145 species of birds that breed here in the UK. The local 1km survey squares that had more varied habitats had more breeding birds. Over four years of surveying, 33 UK Red-listed species and 45 Amber listed species from the Birds of Conservation Concern list were recorded. These are species which have declining populations, are already at low populations or considered rare here in the UK.

## Wintering birds

There were more species of wintering bird in squares with higher habitat diversity, and there was also a strong association with improved grassland for these species. Patterns in our data suggest a positive effect of AES at the local level on wintering birds.



## Bees

On bee transect walks we saw a total of 19 bumblebee species and counted almost 40,000 individuals. We had many more bumblebees where more flowers were present across all the survey squares.

## Hoverflies

We found greater numbers of larger, highly mobile hoverflies where there was more AES in the surrounding landscape. Some hoverflies feed on aphids and we recorded more of these species in areas with more arable land.



## Plants and habitats

Surveyors mapped habitats and recorded the plant communities and the floral resources in survey squares. Areas with high plant diversity had more species of butterflies, moths, bees and bats. More bumblebees were found along bee walks where there were more floral resources.

Areas with a greater range of habitat types also had more species of butterflies and moths, and more bird and bumblebee species.



## Bats

Our novel approach to monitoring bats by acoustic recordings was successful with 16 bat species detected. The Common Pipistrelle was recorded the most, but we also picked up rare bats for example Bechstein's Bat and Greater Horseshoe Bat.

We found few effects of AES at the local or landscape scale for bat data when all species were combined. However, we did find effects of AES on individual species. Barbastelle and Daubenton's Bats were found in slightly more survey squares where there was more AES in the surrounding landscape.